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(71) Applicant: WARNER-LAMBERT COMPANY [US/US]; 201 Tabor Road, Morris Plains, NJ 07950 (US).		Published <i>With international search report.</i>	
(72) Inventor: ALTHAUS, Wolfgang; Hülberg 6, D-42349 Wup- pertal (DE).			
(74) Agents: RYAN, M., Andrea; Warner-Lambert Company, 201 Tabor Road, Morris Plains, NJ 07950 (US) et al.			
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Fig. 1 is a perspective view of a flexible, elongated device 1, such as a catheter. The device includes a handle 2, a bendable section 3, and a distal tip 10. A cross-section III is indicated.

The invention concerns a method for the manufacture of the handle of a wet razor, in particular a disposable wet razor, in which in consideration of the low material requirement and low production costs of high volume, the possibility of variation with regard to the grip arrangement and consideration of the different technological requirements is ensured. The handle thereby comprises at least two shaped elements with connecting regions complementary to each other, which are formed separately and form the handle when they are placed together and connected to each other.

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MULTIPLE PIECE HANDLE FOR DISPOSABLE RAZOR

5 The present invention is directed to a multiple piece handle for disposable razors and a method for the manufacture of the handle of a wet razor, and in particular, the handle of a disposable wet razor.

10 **BACKGROUND OF THE INVENTION**

 Disposable wet razors are known in the art. For many years, complete disposable wet razors have been articles mass produced at reasonable costs and have provided a suitable and sufficient shave. Generally, disposable wet
15 razors consist of a handle with a gripping part and a receiving part for receiving a razor blade or a razor blade unit. Disposable razors are distinguished from conventional wet razors in that in disposable razors the handle region is an integral component of the whole razor,
20 whereas non-disposable razors are often constructed of separate components. The individual elements comprising the wet non-disposable razor systems permit the use of technological developments of the separate components which is not possible by integral disposable systems.

25 It is known in the art that the comfort and quality of a shave is influenced by a series of different elements of the razor system of which the gripping region is one such important element. The arrangement of the gripping region
30 is therefore a constant optimization of a large number of possible factors of improved handling, improved grip and improved balance. In addition, different forms and completely different shapes and technological quality of the gripping region can be made. For example, pre-surgical
35 area disposable razors may be arranged completely differently than barber razors or complete disposable razors for wet shaving. Disposable wet razors are mass produced articles, whereby the smallest economical

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influence has to be taken into consideration, and, as such, the desired varied requirements can not always be fulfilled.

5 Known handles of wet razors, in particular disposable wet razors, are conventionally provided by an entirely plastic formed part or a plastic part with a longitudinally formed core. One successful embodiment of an open-and-closed handle design contains a double S-shaped section.
10 This particular shape provides a design which ensures proper handling for the user during shaving. It can easily be demonstrated that any change of the shape will lead to more open areas which will reduce the handling substantially. Nevertheless, the double S-shaped design is
15 material extensive because it represents the surface equivalent of five side elements and, because of the very tight material organization, the cooling ability of the molding tool during manufacture is limited so that the molding cycle time will not be below 7-8 seconds.

20 A second technical improvement for disposable handle design and manufacture is based on a design with a longitudinal core. This solution avoids the disadvantage of the five side elements of the previous embodiment, but
25 requires greater wall thicknesses for stability which need a longer cooling time in the molding tool before the disposable handle may be injected. Consequently, there is no material saving (due to greater wall thicknesses for stability) and a fairly long cycle time of about ten
30 seconds (due to the longer cooling time and the time needed to remove the core). It is also obvious that tool designs with a core are more expensive and allow fewer cavities per tool for any given molding machine size. On the basis of this production method the possibilities of variation with
35 regard to the arrangement of the shape from the standpoint of economical manufacture, i.e. with minimum material

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content and minimal production costs, are severely limited. In addition, there are practically no additional inserted variable elements which would improve characteristics such as balancing, gripping, or the like. Finally, the assembly method has an influence on the conventional methods of production of handles in which a razor blade unit must be arranged on to the blade.

Summary of the Invention

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The present invention is directed to a multiple piece disposable razor handle and a method of the manufacture of such a handle of a wet razor. In particular, the invention is directed to a disposable wet razor which is improved such that, in consideration of the low material requirement and low production costs of high volume production, the possibilities of variation with regard to the grip arrangement and consideration of the different technological requirements are ensured.

20

As the technical solution to the object of the present invention, a method for the production of the handle of a wet razor, in particular a wet disposable razor is proposed, whereby at least two shaped elements, with each element manufactured separately and having connecting regions complementary to each other, are utilized to form the handle when they are positioned together and connected to each other.

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According to the present invention, the disposable wet shave razor handle is made by a modular system in which the desired individual elements are variable. Separate elements or shaped elements with different surfaces or special additional elements can be provided. By means of the positioning together of the shaped elements the blade assembly can be considerably simplified and also adjustment

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to be such so that the handle fits a new razor blade system. In addition, special requirements for particular insert areas can be considered with ease.

5 It is proposed that the shaped elements of the handle are advantageously thin walled, shell shaped elements. It is particularly advantageous for the shaped elements to be made from plastic parts. According to a further proposal of the invention there may be two elements which form the handle when positioned together are create a separation plane which is flat and lies along the longitudinal middle axis of the handle. According to a preferred embodiment of the invention, two mirror symmetrical shell formed elements are provided.

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15 Moldflow analysis and finite element evaluation have demonstrated that a technically proper designed thin walled shall shaped element will provide a higher stability and can be manufactured on molding machines in less then six seconds. With this design, the two halves of the molding tool used to form the open shells can be cooled quicker and more efficiently, thereby leading to a dramatic reduction in the mold cycle time. Depending on a specific design of a thin walled disposable handle element, it is possible to achieve a cooling time of less then two seconds with an overall process time of less than five seconds. Ribs can be added to provide sufficiently even if the wall thicknesses are below 1 mm. The filling of the mold tool is faster since insert pressure can be higher and the flow of plastic material into the mold is not interrupted by many design and shape intersections. The simpler parts, which ultimately will provide a more complex and user friendly disposable handle design, need less complex and sophisticated molding tools. In a given molding machine more cavities can be incorporated. The present invention therefor insures less material for a required surface size,

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shorter cycle time due to better tool cooling and filling, more cavities per given machine size and less investment due to simpler tools. The assembly of the two shells will be performed on the assembly machine with positive impact on the machine speed because the open shell elements provide better orientation features for bowl feeding. It is also obvious that the two or more shell design provides a variety of new methods to attach the handle to the blade unit.

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In a preferred embodiment, additional elements can be placed in or on the separate shaped elements. One such embodiment of the invention provides a weight element is provided. Still further, strengthening lugs can be provided in the shaped elements.

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The connection of the shaped elements according to the invention can be provided by any form of adhesive. Welding or any particular connection technology, including simple grip connections, can also be used. The connection advantageously occurs during the assembly of the razor.

20

By means of the inventive method, it is possible to vary the handle of various disposable wet razors. The handle of the invention is of modular construction and the separate modules can be varied according to the requirements of the particular razor or the state of the technological developments.

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Further, disposable razor handles of the present invention may be economically constructed from combinations of different materials, for example from rubber with plastic or metal elements with plastic. Likewise the same material on different colors can be combined and thereby the aesthetic performance considerably improved.

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Finally the invention protects a handle of a wet razor, in particular or a disposable wet razor which is characterized in that it is produced by the described process that it comprises at least two shaped elements with two connecting regions complementary to each other.

Brief Descriptio of the Drawings

Figure 1 is a perspective view of one embodiment of a handle of the present invention;

Figure 2 is a perspective view of a further embodiment of a handle of the present invention;

Figure 3 is a cross sectional view along lines III - III of Figure 2;

Figure 4 is a cross sectional view of a further embodiment of the present invention; and

Figure 5 is a cross sectional view of a further embodiment of the present invention.

Detailed Description of the Preferred Embodiments

The present invention is directed to a multiple piece disposable razor handle and a method for the manufacture of such a handle of a wet razor, in particular of a disposable wet razor. The embodiment of the present invention illustrated in Fig. 1 comprises a handle of a disposable wet razor which is formed from two half shells 2, 3. While more than two pieces may be employed, in the preferred embodiment illustrated in Figure 1, two half shells 2, 3 comprising thin-walled, plastic shells are used. In the half shells' assembled state, a blade attachment 4 is located at one end for a separately mounted blade cartridge. The attachment 4 is located at one end for a separately mounted blade cartridge. The two half shells 2, 3 are connected together along a separating line 5, which lies in a plane which runs along the longitudinal axis of the handle. In a preferred embodiment, a weight element 6 is arranged between the half shells. Weight element 6 may

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be fastened by fixing lugs 7. In a further preferred embodiment, the connection of the two half shells 2, 3 is provided by means of connectors 8 and 9, so that the assembly can be achieved by a friction fit caused by pressing the two half shells together. Alternatively, rivet connections or the like can be provided. Further, additional fastening means may be employed to protect the handle from breaking when it is subjected to twisting or longitudinal forces. The exemplary embodiment depicted in Figure 1 is particularly suitable as a handle for a disposable wet razor for men.

The exemplary embodiment shown in Figure 2 comprises two half shells 2, 3 with a blade attaching end 4, whereby by the half shells 2, 3 are connected by a separating line 5 which runs along the longitudinal axis. In the embodiment shown in Figure 2, strengthening lugs 10 are provided on the inside of the half shells. In a preferred embodiment, a gripping cushion 11 is arranged on the upper side of the half shell 2. The exemplary embodiment depicted in Figure 2 is particularly suitable as a handle for a disposable wet razor for women.

Figure 3 illustrates the embodiment of Figure 2 in a cross section which is a section along the line III-III of Figure 2. The two half shells are essentially similar and in their symmetry only differ from one another by the middle running line. alternative cross sections are shown in figures 4 and 5, which also show half shells 2, 3 which are connected together along the separating line 5, for example by means of ultra-sonic welding, adhesive and the like.

While there have been described what are presently believed to be the preferred embodiments of the invention, those skilled in the art will realize that various changes

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and modifications may be made to the invention without departing from the spirit of the invention, and it is intended to claim all such changes and modifications as fall within the scope of the invention.

5

While there have been described what are presently believed to be the preferred embodiments of the invention, those skilled in the art will realize that various changes and modifications may be made to the invention without departing from the spirit of the invention, and it is intended to claim all such changes and modifications as fall within the scope of the invention.

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I claim:

1. A disposable razor handle comprising a plurality of shaped elements, wherein the elements are manufactured independently of each other and comprise a connecting
5 region which enables the plurality of shaped elements to be fastened together to form the handle.
2. The razor handle of claim 1, wherein the plurality of shaped elements comprises two elements and a hollow opening
10 is present between the two elements when the two elements are fastened together to form the handle.
3. The razor handle of claim 2, wherein an axis is formed at the intersection of the two shaped elements.
15
4. The razor handle of claim 3, wherein the two shaped elements are fastened together via connecting means.
5. the razor handle of claim 4, wherein the connecting
20 means comprise connectors such that the two shaped elements may be fastened together by a friction fit.
6. The razor handle of claim 3, wherein a weight is placed within the hollow opening.
25
7. the razor handle of claim 6, wherein the weight is held in place by fixing lugs.
8. The razor handle of claim 3, wherein a gripping device
30 is placed on at least one of the two shaped elements.
9. The razor handle of claim 3, wherein at least one of the two shaped elements is in the shape of a half shell.
- 35 10. The razor handle of claim 3, wherein both of the two shaped elements are in the shape of a half shell.

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11. The razor handle of claim 1, wherein at least one of the plurality of shaped elements is constructed of thermoplastic material.
- 5 12. A method for a manufacture of a handle for a disposable wet razor comprising the steps of manufacturing a plurality of shaped elements with each shaped element having a connecting region to allow for the fastening of the shaped elements together to form the handle and
10 fastening the plurality of shaped elements together to form the razor handle.
13. The method of claim 12, wherein the plurality of shaped elements comprises two shaped elements.
- 15 14. The method of claim 13, wherein the two shaped elements are fastened together via connecting means.
- 20 15. The method of claim 14, wherein the connecting means comprise connectors such that the two shaped elements may be fastened together by a friction fit.
- 25 16. The method of claim 14, wherein a weight is placed within the hollow opening.
- 30 17. The method of claim 16, wherein the weight is held in place by fixing lugs.
18. The method of claim 13, wherein a gripping device is placed on at least one of the two shaped elements.
- 35 19. The method of claim 13, wherein at least one of the two shaped elements is in the shape of a half shell.
20. The method of claim 13, wherein both of the two shaped elements are in the shape of a half shell.

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21. The method of claim 12, wherein at least one of the plurality of shaped elements is constructed of thermoplastic material.

5 22. The method of claim 20, wherein the two half shells are formed around a blade unit.

23. The method of claim 20, wherein the handle contains means to prevent breakage when the unit is subjected to
10 twisting and longitudinal forces.

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FIG-1

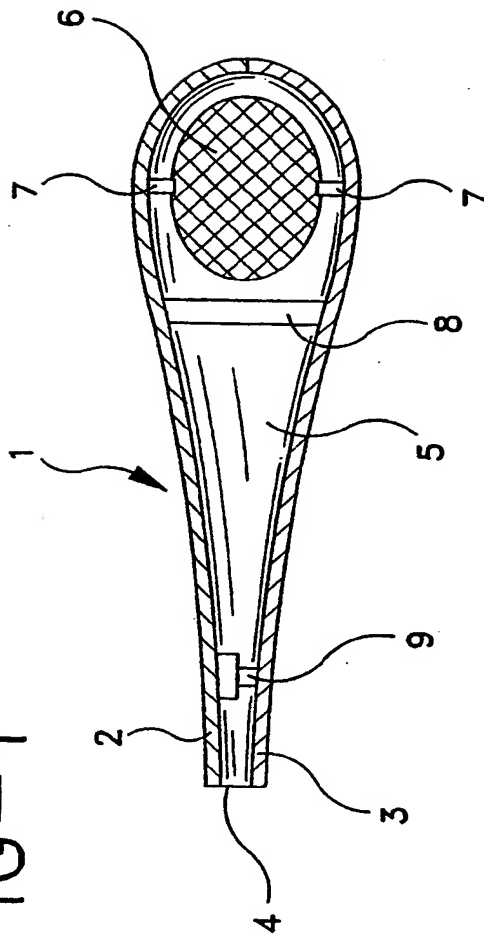
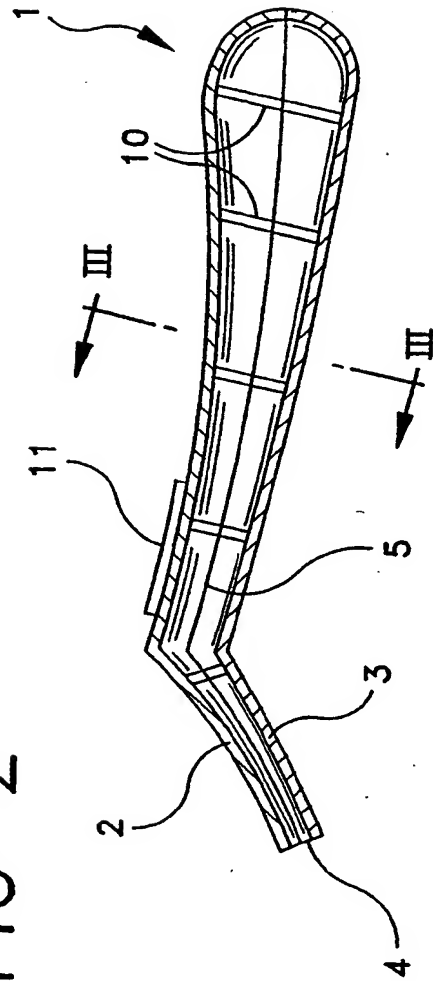


FIG-2



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FIG-5

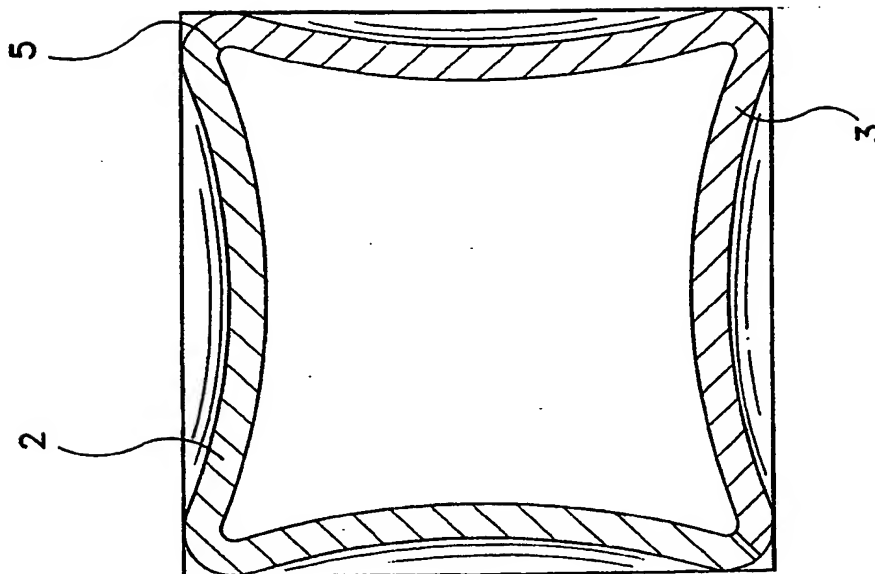


FIG-3

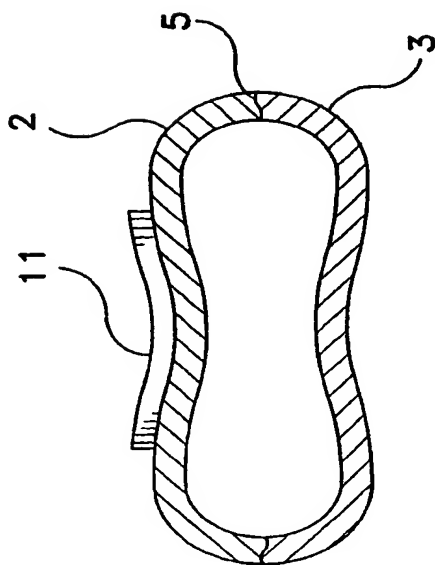
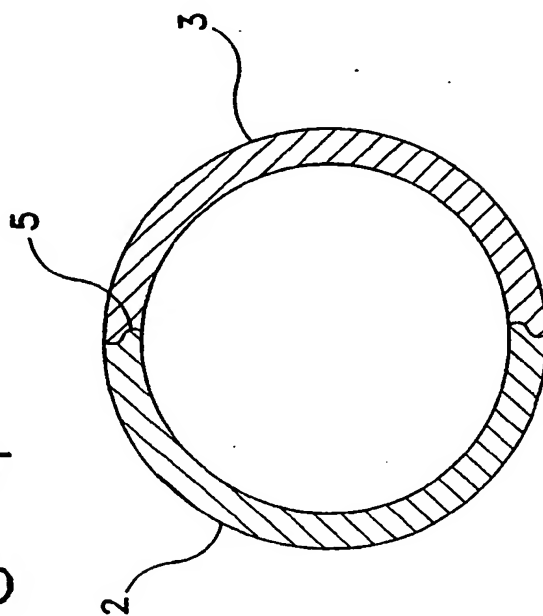


FIG-4



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 96/11940

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: B26B 21/52

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: B62B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A, 5031319 (ALTHAUS ET AL), 16 July 1991 (16.07.91), column 3, line 9 - line 30; column 4, line 23 - column 3, line 31, figures 7-10, claims 1-8, abstract	1-5, 8-15, 18-23
A	column 3, line 31 - line 46, claim 9, abstract	6, 7, 16, 17
X	US, A, 3600804 (THE GILLETTE COMPANY), 24 August 1971 (24.08.71), column 2, line 21 - line 33, figure 4, claim 1, abstract	1-5, 9-15, 19-23
A		6-8, 16-18

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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International application No.

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